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Ignacio Silva

Providence, Contingency, and the Perfection of the Universe

In this paper, I present and analyse the theological reasons given by contemporary authors such as Robert J. Russell, Thomas Tracy and John Polkinghorne, as well as thirteenth-century scholar Thomas Aquinas, to admit that the created universe requires being intrinsically contingent in its causing, in particular referring to their doctrines of providence. Contemporary authors stress the need of having indeterminate events within the natural world to allow for God's providential action within creation, whereas Aquinas focuses his argument on the idea that a universe which includes contingent causes is a more perfect universe. I compare these two approaches, concluding that Aquinas' seems to be better suited to account for true indetermination within the natural world, claiming that divine causality is not required to complement natural causality in its own level.

1. Introduction

For about three centuries, since the wake of modern science in the seventeenth century and until the postulation of Planck's constant in 1900, the universe was thought of as a clockwork mechanism in which all natural events were determined and certain in their precedent causes. Pierre-Simon Laplace is perhaps the most paradigmatic example of a thinker holding this position, taking determinism to the extreme of denying the possibility of contingent events in the natural world.

Since the opening years of the twentieth century, however, contemporary science has offered an image of the natural world full of events which can be described as contingent, random, or indeterminate. For example, one can speak of the contingency of evolution. Replicating genes randomly mutate changing the information contained in their replications. Such replications undergo an evolutionary selective process, which in the long term produced the diversity of life on Earth. Given that random mutation is an intrinsic part of this process, the process itself is usually referred to as a contingent and non-necessary process. In addition, certain interpretations of quantum

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mechanics give also way for speaking of contingent events in nature when they describe the collapse of the wave function as an event which is, in principle, an irreducibly non-deterministic event.

Certainly, chance, contingency, and indeterminism can be understood all in different ways, and their definitions may vary, emphasising one feature or another of the occurrence of the unexpected. For example, one can express that something, in particular something which is referred to as a cause, is said to be indeterminate if its effect does not occur once that thing, the cause, occurs. Or that something, or some action, is said to be contingent if it does not flow from its cause by necessity. As well, chance or random events are so called due to their unpredictability. For the sake of my argument, however, I will treat these terms to belong to a common family of terms and to be referencing the same type of reality. Thus, following the examples described above, in this paper, I will understand that certain natural events can be said to be contingent as long as they happen without their being fully determined by their causes.

Contingency has also been an important notion in the traditional understanding of the doctrines of creation and providence. My aim in this paper is to examine the relation that some contemporary theological work on providence and divine action has with contingent natural events, and how this work relates to a more traditional understanding of these notions, in particular that of Thomas Aquinas. In doing so, I will also discuss the implications of these different theological perspectives on providence and natural contingency to ideas concerning the perfection of the created universe.

In 1989, the Center for Theology and the Natural Sciences (CTNS) at Berkeley, California, began a long-term collaborative research project with the Vatican Observatory (VO) called *Scientific Perspectives on Divine Action*, which involved an international team of philosophers, theologians, physicists, and biologists, the aim of which was to address the issue of divine involvement in the created universe. Two convictions guided the dialogue within the project. (1) God is usually understood to guide and direct the world providentially, without withdrawing from the history of the world. (2) The natural sciences describe an orderly world. Taking these two assertions together, it might seem that either God is able to act directly in the universe or that the scientific description of the universe would leave no space for God to act. In a way, the scientific image of the universe would limit God's action.

One strategy to tackle this dilemma was to distinguish between general and special divine action, where general divine action refers to the action of God in creation and sustainment of the world and its regularities, and special

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divine action to God's action at a specific time and place in creation. The latter would include miracles (which are not the *explananda* in the contemporary debate, since, even if scholars do not want to deny their possibility, they do tend to minimise them), as well as actions which God might perform without disrupting the natural order. The former, general divine action, has not been taken to be as problematic as the latter, since it has usually been regarded as a necessary part of any theological discourse. Speaking of *special* divine action, then, by speaking of a non-disruptive action, and hence leaving aside the issue of miracles, requires one to seek for spaces offered by the scientific description of the universe in which God could be, in a way, allowed to act. Or better said, speaking of *special* divine action could allow the theologian to interpret certain events, fully described by the laws of nature and science, to be an objective direct divine act. I will expand on this strategy in the following section when considering the views of Robert J. Russell, Thomas Tracy, and John Polkinghorne. It should be enough for now to say that this project set to search for metaphysical spaces where God could act in ways which do not go against the order of the universe and its laws, but which is not reduced to a subjective perception or interpretation of the believer. Typically, these places were found in scientific theories which offered the possibility of an ontologically indeterministic interpretation, explaining the universe in terms of possible events in some domains, levels, or kinds of processes in nature which lack a sufficient efficient natural cause. One of the main conclusions of this project was, in the words of John Polkinghorne, that "interpreting intrinsic unpredictabilities as signs of ontological openness to the operation of other causal principles affords just such necessary room for manoeuvre. So an important point was being made by this exploratory work" (Polkinghorne 2008, 79). For these scholars, the universe is full of intrinsic contingent events which could allow for God's action within the very causal network of the created universe, without disrupting the laws of nature. Thus, if there is to be any kind of purposive divine agency in the universe, the natural causal network should be open to such an influence. This natural openness in the causal network of the universe thus expresses both a sort of imperfection and perfection in creation: an imperfection found in the incompleteness or insufficiency of the causal power of natural things, and perfection found in the fact that God creates the universe in such a way that it has spaces for God to act within that imperfection.

Thomas Aquinas, writing in the thirteenth century, brought about a different argument arriving at a somewhat similar conclusion: that the existence of contingent events in the universe is necessary if one is to give a proper account of divine providence. For Aquinas, the metaphysical notion

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of divine providence required that the universe include contingency in the action of natural causes, thus allowing for the existence of random and chanceful events. Indeed, Aquinas argued that even if these events were to happen because of some sort of inefficiency or deficiency in their causes, the fact that this type of events existed meant that the universe as a whole was a more perfect universe. In the following pages, I will present both these accounts hoping to show that, in the end, beyond their argumentative differences, careful consideration of the subject of divine providence allows us to arrive at the conclusion that creation itself can, and should, be considered as including contingent events which contribute to the perfection of the universe as a whole.

2. Contingency and Special Divine Providence

The universe described by the science of the eighteenth and nineteenth centuries was a perfect piece of machinery, of such a faultless character and necessity that it was thought to be an absolutely determined closed system. Figures of the stature of Claude Bernard (1813–1878), Henri Poincaré (1854–1912), and Edmond Goblot (1858–1935) were so inclined to accept this image of nature that they embraced a strictly deterministic science without hesitation. Thus, Bernard believed that "it is necessary to admit as an experimental axiom that among living beings and the brute bodies the conditions of existence of every phenomenon are absolutely determined" (Bernard 1865, 95, my translation); and Poincaré affirmed, closely following Laplace's acclaimed statement, that "every phenomenon, however small it is, has a cause, and an infinitely powerful mind, infinitely well informed about the laws of nature, would be able to have seen them since the beginning of time. If such a mind existed, we could play no game of chance with him, we would always lose" (Poincaré 1896, 65, my translation). But it is probably Goblot who, in the early years of the twentieth century, closed all paths to contingent and undetermined events by claiming that "science does not allow us to believe in the possibility of contingency … for it is reasonable to attribute unexplained facts to the darkness of our ignorance rather than to contingency" (Goblot 1903, 370, my translation).

Perhaps it was this character of a perfectly closed deterministic system what led Einstein famously to claim that God does not play dice with the universe in face of the appearance of an indeterministic view of nature brought about by quantum mechanics. Or perhaps he thought God to be Laplace's and Poincaré's 'infinitely powerful mind' with whom no one should

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play games of chance (dice included!). In any case, it was the indeterministic character postulated by the Copenhagen interpretation of quantum events about nature what Einstein could not accept. In Einstein's eyes, nature was not to be removed from the perfective completeness of its deterministic character. Quantum indeterminism spoke to him, as well as to others, of an imperfect universe.

This new view of nature, however, was capitalised later in the twentieth century by a group of scientist-theologians who considered that in order to speak meaningfully of divine providence guiding the course of history, the natural world needed to offer some kind of space for God to act directly and without mediation in it. Theology required that nature was open and flexible, contingent in its operations, if it was to allow ongoing divine action without disruption of the order of nature.

Authors such as Robert J. Russell, John Polkinghorne, and Thomas Tracy, following this theological motivation, welcomed the image of an indeterministic universe. The late nineteenth-century scientific view of the world did not offer, for them or for Goblot, a space for God to act in the world. It was a deterministic universe which did not allow to "see in the structural harmonies of organised beings the mark of providential interventions and the signature of a supernatural agent" (Goblot 1903, 370). On the contrary, the new conception of nature brought about by quantum mechanics offers "an indeterministic world of the right sort" where it would seem that "it would be possible for God to act through the structures of nature, yet leave those structures entirely undisturbed" (Tracy 2006, 601). Robert J. Russell and Thomas Tracy, among other scholars, championed this position advancing the idea that, since the discovery of quantum indeterminacy, one needs to accept that the total set of natural conditions affecting a process, that is, the total set of conditions which science can discover and describe through its equations, is in principle necessary but insufficient to determine the precise outcome of that process. The future is ontologically open, under-determined by the present conditions of the system, because the set of underlying natural causes is insufficient to determine the outcome of the event caused by them. In this way, Russell and Tracy argue that nature, featuring such a contingent character at its very basic level, can be theologically regarded as being open to God's action. The indeterministic processes found in nature, described for example in the collapse of the wave function within quantum mechanics, are the open spaces theology needs in order to speak meaningfully of a non-interventionist special providence. Russell's argument is clear: God acts together with nature to bring about quantum events, by actualising one of the several potential outcomes described by the equations, which will

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then expand into macroscopic events to bring about God's plans (see, e. g., Russell 2006). Strictly speaking, nature provides necessary but not sufficient causes of future events. God's action, complementing nature's, constitutes the sufficient cause for the occurrence of the event. Where science employs quantum mechanics and philosophy points to ontological indeterminism, theology sees God acting together with nature to cause the future. God fulfils and complements what nature offers, providentially bringing into being God's plans for all creation. In summary, Russell and Tracy argue that God acts objectively and directly in and through quantum events to actualise one of the outcomes described by the wave function before the collapse, thus causing the future to be as He has planned.

Even if John Polkinghorne rejects this quantum divine action (mostly because we do not yet have a theory to explain the amplification of quantum indetermination into macroscopic events), he still offers a similar understanding of God's acting through the indeterminacies present in the created universe. (He develops this proposal in Polkinghorne 1998, 2000.) His strategy is to analyse chaotic systems, and to suggest that God acts by introducing new information to these systems. Polkinghorne thinks that the study of exquisitely sensitive dynamical systems, the object of study of chaos theory, shows that macroscopic physics is intrinsically unpredictable, even if the equations are strictly deterministic. The key issue is that the systems' evolution depends so much upon its initial conditions that the slightest change in them will make the system develop in a completely different way. In these chaotic systems, the different possible futures are not discriminated from each other by energetic considerations. This means, for Polkinghorne, that new top-down organising causal principles must be at work in order to bring about the future by complementing energetic causality, caused by the input of active information. For Polkinghorne, the notion of information-input turns out to be necessary in order to resolve what actually occurs, becoming the vehicle for top-down operating causality and a possibility to accommodate human and divine agency. Polkinghorne, then, concludes that there should be a flow of information from God to the universe by which God guides it providentially, using its intrinsic unpredictabilities and contingent causal character to bring about God's own plans for the universe.

Two main corollaries come out of these proposals. (1) For these authors, if God's influence is to make a real difference in the universe, God's action in the world should not be an intervention against, but an interaction within the grain of the universe, permitted by the universe's inherent contingency in its operations. It is this feature present in the very causal chain of the universe which provides the metaphysical space for God's providential action.

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Some have suggested this to be a 'God-of-the-gaps' type of argument. Both Tracy and Russell have argued that it can be considered to be so only insofar as these gaps are ontological and necessary in creation itself and not due to a lack in our understanding of nature (as Einstein would have suggested in the early years of quantum mechanics). It is not my goal in this paper to assess the merits and faults of these arguments. I have done so elsewhere (see Silva 2012, 2014a). It should be enough to say for now that, in this kind of arguments, God seems to be reduced to act as a cause among causes, which creates further problems to our notion of God and His action in the world.

(2) The indeterministic character of nature, precisely because it is theologically necessary to account for God's action, perfects nature in at least two distinct ways. Firstly, it perfects nature by providing the space for God's provident action. For these authors, a nature which admits divine involvement within its development is certainly more perfect than a nature which does not. Secondly, this inherently contingent character of the universe perfects nature through God's action. Because God can act in nature without disrupting the created natural order, God perfects its development by guiding it to the ends He has prepared. In a way, this is the very act of perfecting the natural world through the very interacting with the insufficient natural causes present in creation.

I will now turn my attention to Aquinas' ideas on these issues, focusing on his ideas on why nature is contingent in its causing, why this character of natural causes is required by his doctrine of divine providence, and why this character renders the universe to be more perfect.

3. Aquinas I: Natural Contingency

Before moving into Aquinas' notion of providence, it would be worth spending time on his ideas on how natural beings could be said to be contingent in their actions, in order to see how these inform his understanding of divine providence. Natural things are contingent in their being, i. e., they can be or not be. Now, given that, for Aquinas, everything acts according to their being, their actions are also contingent: They can act or not, but most importantly, they can act according to their nature or they can fail in the production of their natural effect. In these cases, following a long tradition, Aquinas speaks of chance or random events as those which happen without their being determined in their causes. Recognising the fundamental metaphysical facts that actions of created beings flow from their own created nature, that is, from the principle of actuality in things, and that all things have a

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certain admixture of imperfection, explains how there can be at least some contingency in nature. Put differently, every natural active cause can fail in its causing. Contemporary science somewhat confirms this insight questioning the very necessity in nature once supported and defended, making one wonder whether nature is more whimsical and capricious than determinate.

In his discussion of contingent natural events, Aquinas distinguishes between events which almost always happen and those which happen almost never, but do happen: "For things belonging to one species for the most part attain to the end of that species, because nature achieves its purpose always or nearly always, and fails in a few instances on account of some corruption" (*SCG*, c. 39)[1]. Aquinas explains that those events which occur *ut in pluribus* (i. e., most of the times) were in their causes as almost determined, and that there were no impediments in the process of causing the effect. This kind of events refers almost without exception to the actions of every single natural being. Aquinas does mention, however, the possibility of events which occur *ut in paucioribus* (i. e., the minority of events), and this kind of events refers to those events which were not determined at all in their causes, but happen *per accidens* (by accident), or *propter aliquam corruptionem* (following some corruption).

The argument as to why it is possible for a cause not to cause what it is meant to cause is constructed, for Aquinas, in terms of the hylemorphic composition of natural beings, which signals one of the key insights that Aquinas can offer today: The question of the contingent (or indeterminate) character of the works of nature is not resolved in terms of extrinsic terms, but according to the very same intrinsic nature of things. That is, the possibility of the existence of an impediment acting as an extrinsic fact requires, for Aquinas, to find its foundation in the intrinsic order of things. Therefore, although Aquinas would agree that natural causes act according to some kind of necessity insofar as they are determined to act in one way, they are at the same time the source of their own contingent action, one that follows their own nature. Ultimately, the root of these events which happen *ut in paucioribus* is the material potency which, hylemorphically speaking, is an intrinsic co-principle of every natural being.

Aquinas affirms on several occasions that the failure of the causal relation which gives place to this type of events can occur due to three reasons: one pertaining to the cause in itself, another to the 'patient' in which the cause

1 See also *S.Th.* I, q. 63, a. 9, co.; *In I Peri Her.*, XIV; *De Ver.*, q. 3, a. 1, co.; *De Malo*, q. 1, a. 3, ad 17; *In II De Cae. et Mun.*, IX; *In VI Met.*, II; *In VI Met.*, III; *SCG* III, c. 99. All texts of Thomas Aquinas were retrieved from *Corpus Thomisticum*, edited by Enrique Alarcón, University of Navarre, http://www.corpusthomisticum.org. All translations are my own.

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acts, and finally to the encounter of many causes. He explains in his *Commentary on Aristotle's Metaphysics*:

> First, because of the conjunction of two causes one of which does not come under the causality of the other, as when robbers attack me without my intending this; for this meeting is caused by a twofold motive power, namely, mine and that of the robbers. Second, because of some defect in the agent, which is so weak that it cannot attain the goal at which it aims, for example, when someone falls on the road because of fatigue. Third, because of the indisposition of the matter, which does not receive the form intended by the agent but another kind of form. This is what occurs, for example, in the case of the deformed parts of animals (*In IV Met.,* III)[2].

Thus, the three reasons are (1) the encounter of many agents; (2) the weakness of the causes in themselves; and (3) the poor disposition of the patient in which the cause acts. I shall now briefly discuss each of these reasons.

a) *propter concursum duarum causarum* (According to the Encounter of Causes)

The first reason for the occurrence of unexpected events given the preceding causes is the concourse of a series of two or more causes. In most of Aquinas' discussions of what happens casually or by chance, the fortuitous concourse of many independent causes that originates the casual event is identified with the *accidental being* (*ens per accidens*). Thus, it seems appropriate to analyse this term, even if briefly, in relation to the *proper being* (*ens per se*). The *ens per accidens* is typically opposed to the *ens per se*, which is recognised given its formal unity, which the *ens per accidens* lacks: "what is *per accidens* does not have a cause, because it is not a proper being, since it is not truly one" (*S. Th.* I, 115, 6, co.).

In this respect, the encounter of a series of independent causes in a time and place cannot be reduced to a cause *per se*, because this encounter does not have a proper unity. According to Aquinas,

> it is manifest that a cause which hinders the action of a cause so ordered to its effect as to produce it in the majority of cases, clashes sometimes with this cause by accident; and the clashing of these two causes, inasmuch as it is accidental, has no cause. Consequently what results from this clashing of causes is not to be reduced to a further pre-existing cause, from which it follows of necessity (*S. Th.* I, 115, 6, co.).

Because natural beings act surrounded by many other natural beings, it is to be expected that two or more of them act upon the same patient acciden-

2 See also *SCG* III, c. 99. Aquinas varies his terminology in different places of his work, thus in the *Commentary* he speaks of the *concursum duarum causarum* (encounter of two causes) while in the *SCG* he uses the expression *propter aliquod fortius agens* (according to some stronger agent).

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tally. In other words, there was no other necessary cause for that encounter to happen. Indeed, for Aquinas, the concourse of many causes cannot be explained by other natural principles because "what is accidental, is properly speaking neither a being, nor a unity. … Wherefore it is impossible for that which is accidental to be the proper effect of an active natural principle" (*S. Th.* I, 116, 1, co.). That is, given that what is *per accidens* is not properly speaking something with an internal unity, it is not possible for this *ens per accidens* to be the effect of a *per se* natural agent, with formal unity. Thus, the event so produced can be considered as caused in a purely accidental way and, not having a cause properly speaking, Aquinas thus speaks of 'accidental contingent causes.'

From the very moment, however, that a determination, a formal unity, is introduced (which could be interpreted as a specific orientation of the causal series), there is no more plurality, no more indetermination, and hence the caused event will now be determined. Nevertheless, what Aquinas highlights is that the very fact that there is a causal series is itself by chance. Not that it is the cause of a chanceful event. The very causal series *is* an effect of chance. Indeed, the causal concourse is accidental, because it does not have a determinate cause. It is chance which brings about the material conjunction of causes.

b) *propter defectum agentis* (According to the Defect of the Agent)

As I have suggested above, Aquinas recognises that a full analysis of the contingent acting of natural agents needs to be done in terms of the hylemorphic composition of these natural beings, which implies the existence of two intrinsic co-principles: first, a principle of being and actuality, of perfection, of determination, that constitutes the being in its own specific essence, and, therefore, determines its nature and its ways of acting, i. e., the form of a thing; and second, a principle of potentiality, of a purely passive capacity of being, which by itself is just indeterminate, indifferent to being or non-being, indifferent to being this or that, and, therefore, of acting in this way or another, i. e., the matter. This composition entails that natural agents are not completely act, that they are not pure determination, but that they are a mixture of actuality and potentiality, of determination and indetermination. Following Aristotle, Aquinas thus teaches that the principle of contingency in the action of natural agents, of their being deficient causes, is to be found in the fundamental potentiality and indetermination of matter: "Aristotle gives as the reason for the possibility and contingency … the fact that matter is in potency to either of two opposites" (*In I Peri Her.*, XIV).

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Aquinas, thus, holds the debility of the agent to be one of the reasons of indetermination and contingency in the action of material beings, the root of which is expressed in terms of the passive co-principle of material beings. Because of this passive principle, the causal powers of natural agents can sometimes fail, expressing a sort of a lack of 'internal energy.' The material potency, which in natural beings is the passive potency, generates the possibility of an 'escape' from the active causal power.

c) *propter indispositionem materiae* (According to the Indisposition of the Matter)

The final reason that Aquinas finds for contingent and indeterminate events happening in nature refers to a principle intrinsic to the being which receives the action of the agent, what he would call the 'patient.' Even if the agent acts according to its full causal power, Aquinas holds that the possibility still exists for the effect not to be produced because of, again, the hylemorphic composition of the being which receives the action. The passive potency of the patient in this case becomes the root of the possibility of a contingent and indeterminate effect to happen. Aquinas explains that, as a co-principle, the form of the patient does not completely and perfectly inform the matter which it informs. That is, it does not complete the total potentiality of the matter. Thus, this passive potency, as long as it is free from the information of form, can be an independent cause, causing materially though not efficiently, of the contingent event.

In sum, the root of the contingency in the acting of natural agents always follows their hylemorphic composition. Indeed, because the material co-principle, which Aquinas identifies with the passive potency, always takes part in every natural action, the natural agent could fail, becoming a deficient agent in the production of its effect. Thus, unexpected effects happen in nature. The material compound, independently of the perfection of the form, always allows for a certain amount of indetermination that exceeds it. The source of this indetermination is the passive potency, which can bring about an effect that was not necessarily determinate in its cause to happen *per accidens*. Thus, Aquinas concludes in his disputed question *De Malo* (q. 16, a. 7, ad 14) that it is not possible to hold, first, a strong natural determinism, denying that *causa posita, etiamsi de se sit sufficiens, necesse sit effectum poni* (given the cause, being by itself sufficient, the effect should be expected out of necessity), and second, that everything which happens in nature requires a cause *per se*. Furthermore, he concludes that those events which happen without a cause *per se* are events *per accidens*, because they do not have a proper cause.

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There is, however, another perspective within Aquinas' thought which would be useful to mention in order to comprehend fully the richness of his account of natural contingency and its relation to the perfection of the universe. Having in mind that God is pure act and matter, as a constitutive co-principle of natural beings, is pure potency, pure capacity of receiving any formal determination, Aquinas argues for a hierarchy of beings between these two poles. Within this hierarchy, act and potency are mixed in different degrees and proportion. Hence, he argues that higher beings have more act and less potency, and that this mixture of act and potency goes downwards gradually, affirming that there are different forms which have more potency[3] and hence, are closer to prime matter. The farther a created being is from pure actuality, the greater its potentiality. Furthermore, because action follows being, Aquinas argues that substances closer to pure potency have a greater possibility of failing in their production of their effect, concluding that with greater potentiality there is a greater indetermination in being and hence in action. Here again, the material cause is the ultimate source of this indetermination. Therefore, natural things would determine their effect in a greater or lesser manner according to their place in the hierarchy of being.

4. Aquinas II: Providence, Contingency, and the Perfection of the Universe

If some natural events are contingent, underdetermined in their causes, or even indeterminate, how was it possible for Aquinas to speak of God's acting providentially through them? Aquinas claims that natural causal powers, even contingent ones, are such due to God's power, upon which they depend at all times. This means, Aquinas continues, that God acts in and through all natural causes, even contingent ones. To explain this claim, Aquinas develops a detailed doctrine of primary and secondary causality, through which he argues that God can be understood to be the cause of the action of natural agents in four different ways.

Firstly, God can be understood as giving the causal power to act, since an operation which follows certain causal power is also ascribed to the giver of that causal power as an effect to a cause. Now, all causal powers of any agent whatsoever are created and, hence, have God as their giver. Then, God causes all the actions of natural things, because He gives them their powers

3 I.e., *plus de potentia,* as Aquinas himself puts it in *De Ente*, c. 3. See also *SCG*, III, c. 69; *De Spirit. Creat*., pro., a. 1, ad 25; *Comp. Theo*., I, c. 74.

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by which they are able to be natural causes. Secondly, since God also upholds natural causal powers in their being, God can be said to cause their actions. The reason in this case is that the preserver of a causal power is said to cause the action of that power; like remedies preserving the proper functions of an organ are said to make it work. Since God not only creates things at the beginning of their existence but preserves them in existence, God is also said to cause the actions of natural things. I have, elsewhere (Silva 2014b), called these two ways the 'founding moments' of God acting in and through natural agents.

I have referred to the other two ways as the 'dynamic moments' of God acting in and through natural agents. Their importance lies in the fact that with them Aquinas is able to argue directly for a provident divine action. Aquinas makes use of the analogy of instrumental causality when explaining the third and fourth ways of understanding God's action in the created universe. Thus, in the third way he affirms that a thing is said to cause another's action by moving it to act, in the sense that the cause applies the other's causal power to action, like when a man causes the knife's cutting by the very fact that he applies the sharpness of the knife to cutting by moving it to cut, for example, a piece of bread or cake. In this way, God causes the action of every natural thing by moving and applying its power to action (as Aquinas explains in *S.Th.* I, 2, 3, co.).

The fourth way refers to when an agent reaches an effect which is not included in the nature of the instrument, but which is reached through the effect of the instrument itself. Recalling Aquinas' account of instrumental causes might be helpful to understand this idea and to differentiate both dynamic moments. Every instrument, while being used as an instrument, has typically two effects: the first one referring to its own nature and the second one which, transcending its own nature, is achieved by the action of the principal agent, meaning that the instrument by and of itself could not perform it unless the principal agent moved it to act in a particular way. For instance, cutting is proper to a knife in virtue of the sharpness intrinsic to it, but cutting a cake in squares or triangles at a birthday party is only possible to the knife through the action of the person in charge. Even if neither the first nor the second effect could be caused by the instrument were it not moved by the principal agent, it is only through the first effect, which refers to the nature of the instrument, that the second effect transcending its nature is performed. It is difficult to cut a cake with a hammer or scissors, one needs a proper instrument with a proper disposition. Therefore, both effects (cutting, and cutting in such a manner) can be attributed both to the instrument and to the principal agent.

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Aquinas uses the analogy of instrumental causality, and its related doctrine, in full: in applying their causal powers to act and in achieving an effect which goes beyond the natural agent's causal power. Thus, in the first dynamic moment, God is applying the natural agent to achieve its own natural effect; while in the second one, God uses the natural agent to produce things exceeding the natural agent's own causal power. Every natural thing is a being, and everything which acts in a certain way causes being (*SCG* III, c. 67). Being itself, however, is an effect which belongs to God alone, because only God can cause being. Therefore, in every action of natural beings, since somehow they cause being, God is the cause of that action, inasmuch as every agent is an instrument of the divine power causing being (John Wippel has extensively discussed the issue of creatures causing being arriving at a very similar conclusion in Wippel 2007).

Yet, the second effect, i. e., that which goes beyond the instrumental cause's power, is produced through the very production of the primary effect, i. e., the instrumental cause's natural effect. Even if without the man's power the knife could not cut, without the edge of the knife the man could not cut in this manner. In a similar manner, Aquinas argues that God moves the natural agent to cause its own natural effect, achieving an effect that goes beyond the power of that natural agent, acknowledging that "the effect does not follow from the first cause, unless the secondary cause is present" (*De Ver.* 5, 9, 12). In a particular way which might surprise many a theologian today, Aquinas admits that the secondary (instrumental) cause determines the action of the primary cause towards this particular effect. Precisely because of this type of argument, Aquinas can claim that even though the divine will is unfailing, some of its effects are necessary and some are contingent, expressing nature's inherent possibility of having deficient causes.

The question is whether this metaphysical doctrine of God's involvement in the actions of natural beings could account for God's providential actions regarding the created universe. In fact, several objections have been raised to accounts similar to the one I have presented here, from many different theological, perhaps more liberal, perspectives. I have engaged with some of these objections elsewhere (Silva 2013), but it might be worth at least briefly mentioning their main concerns. John Polkinghorne (1995, 150), Keith Ward (2007, 51), Philip Clayton (1997, 177), and Thomas Tracy (2008, 255), for example, argue that the distinction between primary and secondary causality is not enough to explain God's special involvement in nature and that it implies admitting that it is God or nature which produces the effect. Their objections emphasise that Aquinas' views leads to occasionalism or a complete absence of God's action in nature. What is more, Polkinghorne

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complains, God's special actions remain unintelligible. I believe that these worries are somewhat unfunded and arise out of the miscomprehension of Aquinas' full doctrine as detailled above.

Returning to the argument as to how to resolve the question on how this doctrine could account for God's providential action, Aquinas teaches that the key feature of a provident act is to order towards an end (*ordinare in finem*, in *SCG* III, c. 73, and *S.Th.* I, 22, 1, co.), adding that God's providence, in particular, reaches all created being, even if it is also true that natural agents are the real causes of their effects, simply because God is also the first cause of the causal powers of that being. In order to explain this doctrine further, Aquinas teaches that God's providential action has two stages: planning and execution of the plan. The planning, ordering, or disposition refers to God's intelligence, while the execution refers to God's will (*SCG* III, c. 71). This execution, Aquinas argues, is performed through the created secondary causes. Now, if every action of every natural agent can be attributed to God as its primary cause in the four ways explained above, and God's action is always a provident action, then God's action extends to all created being. In this way, Aquinas affirms that "that which comes from the operation of the secondary causes is subject to the divine providence" (*SCG* III, c. 77), meaning that God providentially influences the course of nature with His will and reason by moving the secondary causes to cause actually and to achieve the goals that He seeks for the universe.

Throughout this account, Aquinas argues that divine providence entails and requires that at least some created beings cause contingently, implying that some natural causes can fail in the production of their effects, thus not being determined to cause unfailingly. As I mentioned above, Aquinas' reasons differ from those given today for this conclusion. Many authors today would agree with Aquinas in affirming that the universe should include randomness and chance, indeterminism, arguing that it is through these indeterminate events that the divine providence acts. Nevertheless, Aquinas would not agree that the universe need include some measure of indeterminism because the theological certainty of special divine providence requires ontological causal gaps in nature to exist, but rather because the universe would be imperfect if this kind of causality (contingent causality which allows for deficient causality) was not included in it.

I briefly referred to Aquinas' hierarchical view of the universe. Beings which are higher in that hierarchy act more perfectly, whereas those which are lower lack a fullness of perfection in their action, and so they can fail in them. Even if this is so, Aquinas considers that a universe which includes all modes of being, and hence all modes of acting, is more perfect than a

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universe which lacks some of the modes of being: "It would be against the perfection of the universe if there was nothing corruptible, or if no power would fail [in producing its effect]" (*SCG* III, c. 74), and he is quick to relate this doctrine to his ideas on providence: "It is against the notion of divine providence that there is nothing casual or random in things" (*SCG* III, c. 74). As is common in Aquinas, he is certainly short in words for his explanation of this correlation between the modes of being and the perfection of the universe. However, I believe that with this doctrine he is referring to the idea of a universe being complete, both in its modes of beings as in its modes of acting. A perfect universe, as per definition of something perfect, is that which is complete. Hence, a universe which includes all different modes of acting, a complete universe in this respect, is a more perfect universe. In fact, Aquinas repeatedly affirms not only that such a universe is more perfect, but that it is against the very notion of divine providence to affirm that there are no contingent, chanceful, or random events in it.

An interesting feature of this doctrine is that, for Aquinas, contingent events not only include those events which happen due to the failing of the natural cause in its action, i. e., his teachings on events which happen *ut in paucioribus* (events to which today we refer as those which happen due to the intrinsic indeterminate character of nature), but also those which happen due to human free will[4]. In fact, when Aquinas discusses the possibility of human free will choosing evil rather than good (a problem which Aquinas usually relates to the perfection of the universe), he refers to his doctrine of secondary causes failing in the accomplishment of the actions. I would like to argue, even if briefly here, that considering Aquinas' understanding of the human act choosing evil might shed some light into our comprehension of how God can achieve His divine intention through contingent natural events. The fact that Aquinas speaks with similar terminology, which is certainly technical terminology within his own thought, indicates that there is an internal dependence between these two features of his doctrine. Both natural causes and free created agents are contingent in their being and thus in their acting. This feature implies that they can be 'deficient' causes and hence they can 'fail' in their causing. Additionally, both these doctrines are usually discussed in relation to the perfection of the universe: The fact that there are deficient causes in the universe (both natural and free) makes it more perfect.

4 I do not aim to advance here Aquinas' doctrine of evil, free will, and God. Many more able scholars have done so (see, e. g., Davies 2011 or Maritain 1966). I will only elaborate on certain features which will assist in my suggestion of how God may be seen as acting through failing and deficient secondary causes.

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Secondary causes, thus, free and non-free, are contingent in their activity and in their causal capacities, being able, potentially, to fail in the realisation of the determined effect of their natures. It might be worth quoting Aquinas himself here. In one of the many places where he discusses evil, contingent causes, and the perfection of the universe, he states:

> The perfection of the universe requires that there should be inequality in things, so that every grade of goodness may be realised. Now, one grade of goodness is that of the good which cannot fail. Another grade of goodness is that of the good which can fail in goodness … so the perfection of the universe requires that there should be some which can fail in goodness, and thence it follows that sometimes they do fail. Now it is in this that evil consists, namely, in the fact that a thing fails in goodness (*S.Th.* I, 48, 2, co.).

Aquinas is here referring to the broadest sense in which 'evil' can be understood, i. e., the failing of a cause in the causing the effect it intended to cause. This can be understood both in reference to natural beings causing as well as to human free will choosing. Today, we might not want to use the term 'evil' to refer to events which are *per se* contingent, random, or chanceful, but Aquinas' intuitions regarding this matter will, I hope, shed some light into the metaphysics of the mechanism by which God can be said to act through these kind of events. Aquinas explains that when a free agent chooses evil rather than good, that agent is failing in her proper action, becoming thus a deficient cause. This deficient cause implies a lack of goodness in the action, which in Aquinas' metaphysics also implies a lack of *being* in them. Aquinas teaches, then, that God allows this type of events, i. e., free agents choosing evil rather than good, because God can bring good out of them.

The questions now are, (1) how God brings good out of evil events, and, (2) whether this doctrine can help our understanding of God bringing about His goals through contingent natural causes. Scholars dealing with the problem of evil in Aquinas explain this seemingly paradoxical feature by referring to the metaphysical '*line of being*' or good and the '*line of non-being*' or evil[5]. As the first cause of all the actions of created beings, God operates as the first cause on the line of being, causing everything caused by the secondary cause in the effect of being and goodness, in the ways I explained above. The metaphysical line of non-being, on the contrary, appears when secondary created causes, in the case of moral evil these being free agents, fail in their attaining goodness by choosing evil. In doing so, these causes, free agents, become deficient causes operating in the line of non-being, causing, in a way, non-being, and hence extracting goodness from creation, giving, however, the opportunity for God to add new goodness to it.

5 See, e. g., Maritain 1966 and, more recently, Echavarría 2013.

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I want to put forward the argument that something similar happens when non-free natural agents cause in a deficient way. The deficient action of a natural contingent cause, in all it causes in the line of being, i. e., in all the effect does not lack, is used by God to achieve a goal for nature, by using it to create new instantiations of being. This divine providential action would be accomplished not by determining the outcome of the deficient natural activity (as in determining the outcome of the collapse of the wave function or the way a mutation will happen), but by taking advantage of it reaching effects which natural causes cannot reach by themselves, as I explained in the second dynamic moment of God acting in and through natural agents. In this sense, Aquinas further teaches that the actions' natural agents should be understood as being guided by divine providence in two different ways: (1) as ordered to themselves, and (2) as ordered to something else (as explained in *De Ver.* 5, 4). The events which happen according to the regular action of the agent itself, what Aquinas would call 'according to its own intention' in terms of final causation, fall under both ways of understanding the relation between divine providence and natural agents, since they happen according to what was expected and in doing so are guided by the divine will and wisdom. On the other hand, those events which happen due to the failure of the agent's action fall under the second way of understanding the relation between them and providence. In this case, an event which was not determined in its cause but nevertheless happened, i. e., a contingent or random event, is also guided by divine providence because it is caused by God as its first cause, who causes everything which is of being in that event. By means of contingent natural agents ('deficient causes'), God causes what there is of being in this kind of events in order to achieve His goals and intentions. As in the previously discussed analogy of instrumental causality, the principal agent has goals which are not included in the causal power of the instrument but which are nevertheless achieved. God reaches His goals, even when acting through contingent causes.

5. Concluding Remarks

Both for Aquinas and contemporary scholars such as Russell, Tracy, and Polkinghorne, the contingent character of the workings of natural agents is the sign of God's divine providence guiding the universe as a whole and at its most basic levels to its fulfilment. In fact, for all these authors, the doctrine of divine providence requires the created universe to include an amount of contingency, in terms of indeterminate, random, and chanceful events. What

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is more, this requirement means that the universe is a more perfect universe than a universe without contingency and indeterminism would be. Nevertheless, there are significant differences in the reasons given for this conclusion.

On the one hand, for Russell, Tracy, and Polkinghorne, were the universe not contingent in its acting, indeterminate and full of openness towards its future, God would not be able to act providentially in it. For these authors, this is a matter of deterministic causation: If the universe is a closed system in which all natural events are caused (determined) by other natural preceding events, there is nothing for God to cause, there is no space for God to act within that universe. However, in an indeterminate, open universe, in which causes do not fully determine (cause) their effects, God is free to act, complementing and fulfilling the actions of natural causes. Thus, the indeterminate character of nature perfects creation by allowing God to act within its own intrinsic contingent network of causes.

On the other hand, for Aquinas, the doctrine of providence understood as God being the primary cause of the causing of secondary causes, thus acting in and through them, requires that within the set of secondary causes there is a subset of contingent causes which could fail in the production of their effects, making the universe more perfect in the inclusion of the many diverse ways of causing. Aquinas continues teaching that from a contingent indeterminate cause God accomplishes something better in the universe. In fact, he explains (in *SCG* III, c. 74) that even though the *intention* (*intentio* in Latin, i. e., that towards which the cause tends) of the secondary cause does not extend to the indeterminate effect (because it fails to reach its natural effect), God's intention does extend to the effect by ordering these new indeterminate effects to new good things in the universe. In fact, Aquinas goes even further to affirm that, because God providentially guides the whole, some natural events will happen contingently, in the sense that they will occur according to God's *intentio* even though they do not follow the particular secondary cause's *intentio*. In this way, Aquinas' ideas help solving the question about events happening outside the ordinary course of nature, by explaining that even those events which happen randomly or by chance are providentially guided by God's continuous action.

Perhaps one of the most important differences between these two approaches is the way contingency in nature is conceived and treated. For Russell, Tracy, and Polkinghorne, the undetermined character of the universe reflects an insufficiency within the very fabric of the natural causal network. This lack of sufficient causal power requires them to appeal to God's causality as a causal complement to what nature cannot accomplish. The total sum of divine and natural causes is sufficient to cause, for example, the

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collapse of the wave function. Natural indeterminism is not enough to cause natural happenings, and thus true randomness vanishes in this account. Ultimately, for these authors, divine and natural causality work at the same level determining outcomes, and in a way are regarded as competing kinds of causality (hence the necessity to find 'open causal gaps' in nature to allow for God's providential action). For Aquinas, on the contrary, natural causes require God's causal power as the primary cause of their causing, but not in terms of complementing causes. Indeed, natural causes are full causes of their effects in their own domain, and if they become deficient causes, they still are full causes of what they cause. God does not complete the deficiency of natural causality, and hence God does not compete against natural causality to cause natural events. Contingent causes remain contingent causes, and thus the universe remains a perfect universe.

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